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Factors Affecting Success Rate of Dental Implants- A Retrospective Study.

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ABSTRACT

Background: The present study was conducted to evaluate factors affecting success rate of dental implants. **Methods:** This retrospective study was conducted in the department of Prosthodontics. Patients who underwent dental implant therapy in last 2 years were included. Information such as name, age, gender, length of implant, diameter of implant, location of implant, bone quality was retrieved from the patient's record file. **Results:** out of 2350 implants, age group <40 years had males (450) and females (520), age group 41-60 years had males (430) and females (410), age group >60 years had males (320) and females (220). 32 implants with length less than 10mm showed failure, 40 implants out of 900 implant with length 10-11.5mm showed failure and 14 implants out of 350 implants with size >11.5mm showed failure. The difference was significant (P < 0.05). Out of 600 implants placed in bone with type I quality, 1 showed failure. Out of 1050 implants placed in bone with type II quality, 50 showed failure. Out of 500 implants placed in bone with type III quality, 30 showed failure. Out of 200 implants placed in bone with type IV quality, 5 showed failure. The difference was significant (P < 0.05). **Conclusion:** Authors concluded that factors such as diameter of dental implant and quality of dental bone affects the success rate of dental implants.

Keywords: Implants, Osseointegrate, Success.

INTRODUCTION

The use of dental implants is now a widely accepted treatment modality for fully and partially edentulous patients. The success of this approach is rooted in the inherent ability of some dental materials, titanium in particular, to osseointegrate, thereby creating direct bone-to-implant contact. Further improvements toward the successful osseointegration of dental implants have involved modifications to both surface topography and surface chemistry.[1]

Although osseointegrated implants are routinely used for the rehabilitation of partially or totally edentulous patients, presenting high long-term survival rates; biological and technical complications may result in implant failure and loss.5 Implant failures have been reported in frequencies varying from 1% up to 22%. Factors affecting implant failure are diverse and are related to patient systemic status, age and social habits, implant macro-/micro-design and surface chemical composition, implant position, bone quality, and surgical technique.[2]

A few studies have reported long-term results, showing more favorable survival statistics for solid screw over hollow cylinder implants, for mandibular sites over maxillary, and lower survival statistics for patients presenting with a history of periodontitis. Long-term results of implants placed with guided bone regeneration, and outcomes for the treatment of atrophic posterior maxilla have also been reported.[3] The present study was conducted to evaluate factors affecting success rate of dental implants.

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MATERIALS & METHODS

This retrospective study was conducted in the department of Prosthodontics. Patients who underwent dental implant therapy in last 2 years were included. The study protocol was approved from institutional ethical committee.

Information such as name, age, gender, length of implant, diameter of implant, location of implant, bone quality were retrieved from the patient's record file. Results thus obtained were subjected to statistical analysis. P value < 0.05 was considered significant using chi- square test.

RESULTS

Table 1: Distribution of implants in both genders

Age group	Male	Female
<40 years	450	520
41-60 years	430	410
>60 years	320	220
Total	1200	1150

[Table 1] shows that out of 2350 implants, age group <40 years had males (450) and females (520), age group 41-60 years had males (430) and females (410), age group >60 years had males (320) and females (220).

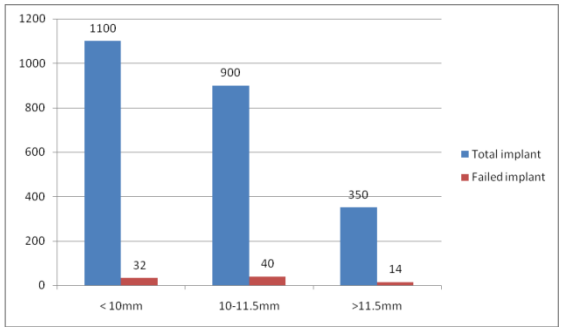

Figure 1: Survival rate according to implant length

Graph I shows that 32 implants with length less than 10mm showed failure, 40 implants out of 900 implant with length 10-11.5mm showed failure and 14 implants out of 350 implants with size >11.5mm showed failure. The difference was significant (P < 0.05).

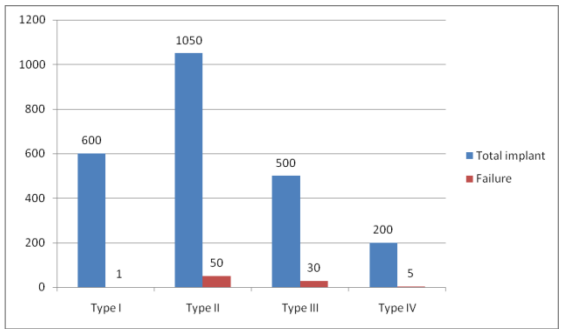

Figure 2: Survival rate based on bone quality

[Figure 2] shows that out of 600 implants placed in bone with type I quality, 1 showed failure. Out of 1050 implants placed in bone with type II quality, 50 showed failure. Out of 500 implants placed in bone with type III quality, 30 showed failure. Out of 200 implants placed in bone with type IV quality, 5 showed failure. The difference was significant (P < 0.05).

DISCUSSION

The reasons for implants failure are lack of osseointegration during early healing, infection of the peri-implant tissues and breakage. The contraindications of implant placement are children & adolescents, epileptic patients, endocarditis, osteoradionecrosis, smoking and diabetes. Absolute contraindications consists of myocardial infarction and cerebrovascular accident, bleeding disorder, cardiac transplant, immunosuppression, active treatment of malignancy, drug abuse, and psychiatric illness, and intravenous bisphosphonate (BPs) use.[3]

However, apart from it, failures in implants are also common.[4] It can be divided into early failure and late failure according to failure time. First, early failure is one that failed osseointegration within several weeks or several months. It was due to bone necrosis, surgical trauma, bacterial infection, inadequate initial stability and early occlusal loading. Late failure is failure that turns up after functional loading of several period of time. It takes place because of infection and excessive loading. There are many difficulties to figure out the cause of implant success and failure because it is affected by many various factors. It is hard to find a reasonable solution only with in vitro study model.[5] The present study was conducted to evaluate factors affecting success rate of dental implants.

We found that out of 2350 implants, age group <40 years had males (450) and females (520), age group 41-60 years had males (430) and females (410), age group >60 years had males (320) and females (220).

Buser et al,[6] found that eleven studies of low to moderate methodological quality were studied. Implants placed in sites with history of one and two implant failures had a weighted survival rate (SR) of 88.7% (95%CI 81.7–93.3) and 67.1% (95%CI 51.1–79.9), respectively. Implants placed in sites with a previous early failure revealed a weighted SR of 91.8% (95%CI 85.1–95.6).

First implants presented higher SR than implants placed in sites with one or two previous implant failures. In contrast, implants placed in sites with one and two implant failures had similar SR.

In present study 32 implants with length less than 10 mm showed failure, 40 implants out of 900 implant with length 10-11.5mm showed failure and 14 implants out of 350 implants with size >11.5mm showed failure. We found that out of 600 implants placed in bone with type I quality, 1 showed failure. Out of 1050 implants placed in bone with type II quality, 50 showed failure. Out of 500 implants placed in bone with type III quality, 30 showed failure. Out of 200 implants placed in bone with type IV quality, 5 showed failure. It is in agreement with Esposito et al.[7]

Albrektsson et al.[8] proposed success criteria for implant FCDPs based on implant, peri-implant tissues, prosthodontic, and subjective parameters. They reported a 95.5% survival rate vs. an 86.7% success rate when their proposed success criteria were applied. FCDPs were deemed as successful when a total of four or fewer complications (mild or moderate severity) were encountered, and these could be addressed chair-side in a single visit.

CONCLUSION

Authors concluded that factors such as diameter of dental implant and quality of dental bone affects the success rate of dental implants.

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